

REMARKS

Claims 1-22 are pending. Claims 15-22 are allowed. By this Response, claims 1, 4, 15, 21 and 22 are amended. Reconsideration and allowance based on the above amendments and following remarks are respectfully requested.

Applicant appreciates the allowance of claims 15-22 and the indication of allowable subject matter in claims 6 and 7.

Claim Objections

The Office Action objects to claims 1-22 under 37 C.F.R. §1.75(a). Specifically, the Office Action alleges that a particular sentence in claim 21 is ambiguous, a phrase in claim 14 lacks antecedent basis and phrases in claims 15, 21 and 22 are grammatically incorrect.

In response, applicant has amended claims 1, 15, 21 and 22 to correct for the minor errors. However, in regard to claim 14, applicant respectfully submits that proper antecedent basis for the phrase “capturing at said two view points” is provided within the claim. Specifically, recitation of “said subject at two of said plurality of viewpoints” in line 3 of claim 14 provides the antecedent basis for the “said two viewpoints” at line 5 of claim 14.

In view of the above, applicant respectfully requests withdrawal of the objections.

Prior Art Rejections

The Office Action rejects claim 1, 2, 4, 5 and 12 under 35 U.S.C. §102(b) as being anticipated by Lu (U.S. 5,852,672); claims 3, 8, 10 and 11 under 35 U.S.C. §103(a) as being unpatentable over Lu and Bacs, Jr. et al. (U.S. 6,324,347); claim 9 under 35 U.S.C. §103(a) as being unpatentable over Lu, Bacs, Jr. and Lo, et al. (U.S. 6,269,223); claim 13 under 35 U.S.C. §103(a) as being unpatentable over Lu; and claim 14 under 35 U.S.C. §103(a) as being unpatentable over Lu and Moreton, et al. (U.S. 5,835,133). These rejections are respectfully traversed.

Embodiments of the present invention provide an image capturing apparatus that is capable of determining the depth of a subject within the image. A single capturing section is used to obtain the images at a plurality of view points. Thus, multiple capturing sections, i.e., cameras, do not have to be used thus reducing the size and cost of the overall system.

In contrast Lu teaches a three-dimensional camera system that uses three (3) stereo imaging units 14, 16 and 18. Within each of these stereo imaging units are two cameras 42, 44 and a projection system 48. The two (2) cameras are used to obtain various viewpoints of an image located between the cameras. The camera system is designed to capture a three-dimensional view of an object. Thus, Lu's system utilizes three (3) stereo units comprising a total six (6) cameras, or imaging capturing devices. See column 5, lines 30-55.

Claims 1-4, each recite, “a capturing section operable to perform image capturing for said subject at a plurality of viewpoints.” As discussed above, Lu teaches using multiple capturing sections to perform image capturing and not a capturing section as claimed.

Further, claim 4 recites “a depth calculating unit operable to calculate a depth of a particular region of said subject based on two or more images obtained by said image capturing performed for said subject two or more times at said one viewpoint and another image obtained by said image capturing performed at another viewpoint different from said one viewpoint.” Nowhere does Lu teach a depth calculating unit, let alone a depth calculating unit which calculates a depth of a particular subject based on images obtained from the image capturing performed by the capturing section at two different viewpoints where two or more images are used from one viewpoint and another image is used at the other viewpoint. Lu teaches obtaining various images from the multitude of video cameras. These images are then used to provide a three (3) dimensional view of the subject, not to determine distance. As disclosed at column 7, lines 12-25 of Lu, stereo images are obtained which are converted to time series three dimensional surfaces of an object. Distances are not calculated and further, two or more images at one viewpoint and another image at another viewpoint are not used to calculate the depth. Thus, the features of claim 4 are not taught by Lu.

Thus, Lu fails to teach all the claimed features of independent claims 1 and 4 as required. Further, Bacs, Lo and Moreton fail to make up for Lu's deficiencies. Thus, in view of the above, independent claims 1 and 4 and dependent claims 2, 3, 5 and 8-14 are distinguishable over the cited art.

Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

Conclusion

For at least these reasons, it is respectfully submitted that claims 1-4 and 8-14 are distinguishable over the cited art. Favorable consideration and a prompt allowance are earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad J. Billings (Reg. No. 48,917) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/934,573

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)